PELVIC GIRDLE

PATHOLOGY

1.) Ankylosing Spondylitis
- Rheumatoid arthritis variant involving the sacroiliac joints & spine

2.) Congenital Hip Dysplasia
- Malformation of the acetabulum causing displacement of the femoral head

3.) Legg-Calve Perthes Disease
- Flattening of the femoral head due to vascular disruption

4.) Slipped Epiphysis
- Proximal portion of femur dislocated from distal portion at the proximal epiphysis

A.) PELVIS & UPPER FEMORA

AP PROJECTION

PP: Supine; feet & leg rotated 15-20^{o} medially (places femoral neck // to IR); heels 8-10 in. (20-24 cm) apart

RP: 2 in. inferior to ASIS or 2 in. superior to pubic symphysis

CR: ⊥

SS: Greater trochanter in profile

Lesser trochanter: seen if feet & leg are rotated laterally

LATERAL PROJECTION

PP:
- **Lateral recumbent:** place support under lumbar spine; vertebral column // with table; pelvis in true lateral
- **Upright:** patient stand straight; weight equally distributed on feet; MSP // to IR

RP: 2 in. above greater trochanter

CR: ⊥

SS: Lateral radiograph of lumbosacral junction; sacrum; coccyx; superimposed upper femora

Berkebile, Fischer & Albrecht:
- Recommended dorsal decubitus lateral projection of pelvis
- Demonstration of "gull-wing sign" in cases of fracture dislocation of the acetabular rim & posterior dislocation of femoral head

B.) CONGENITAL HIP DISLOCATION

MARTZ-TAYLOR METHOD

- **Recommendations:** 2 AP projections of pelvis
- **CR:** ⊥ to pubic symphysis (1st projection)
  - To detect any lateral or superior displacement of the femoral head
- **CR:** ⊥ to 45^{o} to pubic symphysis (2nd projection)
  - **Anterior displacement:** femoral head above acetabulum
  - **Posterior displacement:** femoral head below acetabulum
- **SS:** Relationship of femoral head to the acetabulum
- **ER:** For patients with congenital hip dislocation

ANDREN-VON ROSEN APPROACH

- Bilateral hip projection
- **PP:** Both legs forcibly abducted 45^{o}; femora rotated inward
- **ER:** For diagnosing congenital hip dislocation in new borns

C.) FEMORAL NECKS

MODIFIED CLEAVES METHOD
AP OBLIQUE PROJECTION
Bilateral Frog Leg Position

PP: Supine; ASISs equidistant from table; hips & knees flexed & feet draw up (places femora in nearly vertical position); thigh abducted 25-45^{o} from vertical; feet turn inward; soles against each other

RP: 1 in. superior to pubic symphysis

CR: ⊥

SS: Acetabulum, femoral head, femoral neck & trochateric areas

Unilateral Projection

PP: Supine; affected hip & knee flexed & feet draw up; soles against opposite knee; thigh abducted 45^{o} laterally

RP: 1 in. superior to femoral neck

CR: ⊥

SS: Acetabulum, femoral head, femoral neck & trochateric areas

ORIGINAL CLEAVES METHOD
AXIOLATERAL PROJECTION

PP: Same position as Modified Cleaves

RP: 1 in. superior to pubic symphysis

CR: 25-45^{o}

SS: Acetabulum, femoral head, femoral neck & trochateric areas

D.) HIP

AP PROJECTION

PP: Supine; ASISs equidistant from table; foot & leg rotated medially 15-20^{o} (places femoral neck // to IR);

RP: Femoral neck

CR: ⊥

SS: Hip joint

LAUENSTEIN & HICKEY METHODS
LATERAL PROJECTION
Mediolateral

PP: Supine; patient rotated toward affected side; knee flexed & thigh draw up; opposite side extended

RP: Hip joint

CR: ⊥ (Lauenstein); 20-25^{o} cephalad (Hickey)

SS: Hip joint

- Femoral neck superimposed over greater trochanter (Lauenstein)
- Femoral neck free of superimposition (Hickey)

ER: To demonstrate hip joint & relationship of femoral head to the acetabulum

DANELIUS-MILLER METHOD
AXIOLATERAL PROJECTION
Cross-table/Surgical-lateral Projection

PP: Supine; pelvis elevated; knee & hip of unaffected side flexed; leg of unaffected side rested on support; foot & leg of affected side rotated 15-20^{o}; IR vertical; IR // to long axis of femoral neck

RP: Femoral neck

CR: Horizontal

SS: Hip joint; acetabulum, femoral head & neck; trochanters

CLEMENTS-NAKAYAMA MODIFICATION
MODIFIED AXIOLATERAL PROJECTION

PP: Supine; limb in neutral or slightly rotated position; IR vertical & its top back tilted 15^{o}; IR // to long axis of femoral neck

RP: Femoral neck

CR: 15^{o} posteriorly

SS: Lateral hip; acetabulum; femoral head & neck; trochanters

ER:

- Useful when patient cannot be positioned in Danelius-Miller method
- Perform on patient with bilateral hip fractures, bilateral hip arthroplasty or limitation of movement of unaffected leg

CHASSARD-LAPINE METHOD
AXIAL PROJECTION

PP: Seated; patient lead directly forward; posterior surface of knee against edge of table; vertical axis of pelvis tilted 45^{o}; patient grasp the ankles;

RP: Lumbosacral region (level of greater trochanter)

CR: ⊥ or ⊥ to coronal plane of symphysis pubis (if body flexion if restricted)
SS:

- Relationship b/n femoral heads & acetabulum
- Pelvic bones
- Opacified rectosigmoid (Barium Enema)

ER: For measuring the transverse or biischial diameter in pelvimetry

LEONARD-GEORGE METHOD

PP: Supine; pelvis elevated (places greater trochanter 4 in. above table top); unaffected side hip & knee flexed; thigh abducted; foot rotated 15-20^{o} internally (to overcome anterversion of femoral neck); IR vertical; uses curved cassette
RP: Depression superior to greater trochanter
CR: Medially & inferiorly perpendicular
SS: Femoral head & neck; trochanteric area

FRIEDMAN METHOD
AXIOLATERAL PROJECTION

PP: Lateral recumbent; affected side against IR; affected limb in true lateral; unaffected limb rolled 10^{o} posteriorly;
RP: Femoral neck
CR: 35^{o} cephalad
SS: Femoral head & neck; trochanteric area; proximal shaft of femur

E.) ACETABULUM

TEUFEL METHOD
PA AXIAL OBLIQUE PROJECTION

PP: Semiprone; RAO/LAO; unaffected side elevated; MSP 38^{o} from table; knee of elevated side flexed
RP: Acetabulum or inferior level of coccyx (2 in. lateral to MSP toward side of interest)
CR: 12^{o} cephalad
SS: Fovea capitis; superoposteior wall of acetabulum

JUDET METHOD
AP OBLIQUE PROJECTION

Judet & Letournel: described two 45^{o} posterior oblique position
PP:

- **Internal Oblique:** semisupine; LPO (places hip in internal oblique); affected hip up; MSP 45^{o} from table
- **External Oblique:** semisupine; RPO (places hip in external oblique); affected hip down; MSP 45^{o} from table

RP:

- **Internal Oblique:** 2 in. inferior to ASIS of affected side
- **External Oblique:** pubic symphysis

CR: ⊥
SS: Acetabular rim
ER:

- Useful in diagnosing fxs of acetabulum
- **Internal Oblique:** For patient with suspected fx of iliopubic column (anterior) & posterior rim of acetabulum
- **External Oblique:** For patient suspected fx of ilioischial column (posterior) & anterior rim of acetabulum

Rafert-Long Modification:

- Modified Judet Method
- Same position as Judet Method
- **CR:** Horizontal (for external oblique) & Perpendicular/Vertical (for internal oblique)

F.) ANTERIOR PELVIC BONES

PA PROJECTION

PP: Prone; IR center to greater trochanter (level of pubic symphysis)
RP: Distal coccyx
CR: ⊥

SS: Pubic symphysis & ischia; obturator foramina

TAYLOR METHOD
AP AXIAL "OUTLET" PROJECTION

PP: Supine; ASISs equidistant from table; knee flexed slightly
RP: 2 in. distal to superior border of pubic symphysis
CR: 20-35^{o} cephalad (males); 30-45^{o} (females)
SS: Pelvic outlet

- Superior & inferior rami without foreshortening

BRIDGEMAN METHOD
SUPEROINFERIOR AXIAL "INLET" PROJECTION

PP: Supine; ASISs equidistant from table; knee flexed slightly; IR center at level of greater trochanters
RP: level of ASISs
CR: 40^{o} caudad
SS: Pelvic ring/inlet

LILIENFELD METHOD
SUPEROINFERIOR PROJECTION

PP: Seated-erect; knees slightly flexed; patient lean backward 45-50^{o}; arch the back (places pubic arch in vertical position)
RP: 1.5 in. superior to symphysis pubis
CR: ⊥
SS: Pelvic ring/inlet

- Anterior pubic & ischial bones
- Symphysis pubis

STAUNIG METHOD
INFEROSUPERIOR PROJECTION

PP: Prone
RP: Symphysis pubis
CR: 35^{o} cephalad
SS: Pelvic ring/inlet

- Anterior pubic & ischial bones
- Symphysis pubis

G.) ILIUM

AP OBLIQUE PROJECTION

PP: Supine; RPO/LPO; unaffected side elevated 40^{o} (places broad surface of the wing of affected ilium // to IR); shoulder, hip & knee elevated
RP: Level of ASIS
CR: ⊥
SS:

- Unobstructed projection of ala & sciatic notches
- Profile image of acetabulum
- Broad surface of the iliac wing without rotation

PA OBLIQUE PROJECTION

PP: Supine; RAO/LAO; unaffected side elevated 40^{o} (places affected ilium ⊥ to IR); patient rested on forearm; knee of elevated side flexed
RP: Level of ASIS
CR: ⊥
SS:

- Ilium in profile
- Femoral head within acetabulum

☺ THE END ☺

"BOARD EXAM is a matter of PREPARATION. If you FAIL to prepare, you PREPARE to fail"
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